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CURRENT SERIAL RECORDS

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Animal Disease Eradication Division Interim Specifications  
Agricultural Research Service  
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Technical Services

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LINDANE WETTABLE POWDER INSECTICIDE FORMULATIONS PERMITTED IN

ANIMAL DISEASE ERADICATION DIVISION PROGRAMS

MAR 14 1969

1. SCOPE

CURRENT SERIAL RECORDS

1.1 This interim specification covers 25 per cent lindane (1,2,3,4, 5,6-Hexachlorocyclohexane, gamma-isomer) wettable powder insecticide formulations permitted in the official treatment of specific livestock diseases as authorized by the Code of Federal Regulations administered by the Animal Disease Eradication Division.

1.2 This is a general specification designed to cover all permitted lindane wettable powder insecticides now in use or which may be adopted by the Animal Disease Eradication Division. Recommendations for changes to interim specification should be addressed to this Division.

1.3 The specification covers 25 per cent lindane wettable powders of unlimited formulation except as specified with regard to amount of insecticide ingredient and particle size. Refer to 2.1 and 2.1.1.

2. REQUIREMENTS

2.1 Composition - The insecticide powder shall contain not less than 25 per cent of pure lindane and not more than 75 per cent inert ingredients. Method of test should be equivalent to that described in World Health Organization, "Specifications for Pesticides", 2nd. ed., p.94 and Annex 1, Geneva (1961).

2.1.1 Inert Ingredients - There are no restrictions regarding the adjuvants or diluents to be used in the insecticide powder provided these are non-injurious to livestock under normal conditions of use. However, regardless of composition, the wettable powder formulation must conform to the specifications for particle size given in 3.

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1. The term "permitted" refers to those compounds that meet the standards of the Animal Disease Eradication Division for the particular use required. Only "permitted" compounds can be used in official work of the Animal Disease Eradication Division. It should be noted that though a product may be approved by the United States Department of Agriculture, this does not necessarily imply it is "permitted" in Animal Disease Eradication programs.

2.2 Maintenance of Dip and Spray Insecticide Concentration - The powder shall be so formulated that actual animal dipping vats of stipulated lindane concentration limits shall be obtained and maintained by appropriate initial vat charge and periodic insecticide replenishment<sup>2</sup>. Maintenance of insecticide level shall be determined by chemical procedure upon representative dip samples by official technical laboratories.

2.3 Foaming - Any foaming properties of test suspensions shall not be such as to interfere with tests specified herein.

### 3. PARTICLE SIZE

3.1 Average Diameter - The surface-mean particle diameter of the insecticide powder shall not be greater than 1.0 microns, as determined by the air-permeation method, given below:

#### 3.1.1 Determination of Average Diameter -

##### Apparatus:

- 1) Self-calculating air-permeation apparatus of the U. S. Department of Agriculture (Patent No. 2,261,802), or equivalent. The "Sub-Sieve Sizer", Fisher Scientific Co., may be used as instrument for test; the device should be calibrated.
- 2) Specific gravity bottle (pycnometer), nominal volume 50 ml or greater, equipped with ground-in thermometer; the pycnometer should be calibrated.

##### Procedure:

By means of pycnometer, determine powder density upon as great as practicable a weight of sample immersed in air-free distilled water. The density is usually between 2.1 to 2.4 grams per cc.

Using a weight of wettable powder sample equivalent to the density determined above, obtain the average particle diameter as described by instructions supplied with the air-permeation apparatus.

3.2 Maximum Diameter - A) Not less than 99.0 per cent of a recently prepared sample of lindane wettable powder shall pass through a 44-micron sieve (U.S. Standard Sieve No. 325, Federal Specification RR-S-366) in the test given in 3.2.1.

B) Not less than 99.5 per cent insecticide powder subjected to simulated storage conditions (refer to test given in 3.2.2) shall pass through a 44-micron sieve.

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2. The Animal Disease Eradication Division issues periodic memoranda detailing proper vat handling procedure for lindane powders. Inquiries should be directed to Animal Disease Eradication Division, Agricultural Research Service, United States Department of Agriculture, Federal Center Building, Hyattsville, Maryland, 20781.

3.2.1 Determination of Maximum Diameter Upon Virgin Lindane Insecticide Powder -

Apparatus:

- 1) 1 oz air-tight screw-cap glass ointment jar.
- 2) Oven, regulated to maintain  $55^{\circ}\text{C} \pm 1^{\circ}\text{C}$ .
- 3) 8 oz air-tight screw-cap glass ointment jar.
- 4) Tumbling machine: Any device for tumbling, end-over end, the 8 oz jar (item 3) at 60 revolutions per minute.
- 5) Clean grease-free U. S. Standard Sieve #325, Federal Specification RR-S-366.
- 6) Sprayer: Circular shower head of 6-8 cm diameter with c. 50 evenly spaced holes and connected by hose to tap water. The size and number of holes should be adjusted so that at a flow rate of 4-5 liters of tap water per minute, the spray will rise no more than 15 cm when the shower head is inverted.

Procedure:

- 1) Add 8.00 g powder sample to 50 ml distilled water in 8 oz. jar. Allow powder to settle undisturbed for 3 minutes. Cap jar and tumble on machine for 5 minutes. Dilute with 185 ml distilled water and tumble again for 1 minute.
- 2) Transfer suspension to 44 micron sieve. Wash residue on sieve for 10 minutes with sprayer adjusted to deliver 4-5 liters per minute.
- 3) Transfer residue to previously dried (at c.  $100^{\circ}\text{C}$ ) tared filter. Dry residue at same temperature as tare. Weigh and calculate per cent sample which passed through sieve.

3.2.2 Determination of Maximum Diameter of Lindane Powder Subjected to Simulated Storage Conditions -

Procedure:

- 1) Store uncapped 1 oz jar at  $55 \pm 1^{\circ}\text{C}$  for 1 hour. Without allowing jar to cool, add 8.00 grams powder sample and cap jar air-tight. Keep in oven 24 hours. Remove from oven and allow to cool, tightly capped, for 3 hours.
- 2) Continue as in 3.2.1. Procedure.

3.3 Dispersibility - Not less than 95.0 per cent of a suspension of lindane wettable powder in standard hard water shall pass through a 44 micron sieve. Refer to 3.3.1.

3.3.1 Determination of Dispersibility -

Apparatus:

Same as for 3.2.1, except omit (6) Sprayer.

Reagents:

- 1) Hard water, 342 parts per million as Calcium carbonate.

Composition:	Calcium chloride, anhydrous	0.3037 grams
	Magnesium chloride, hexahydrate	0.1388 grams
	Distilled water	1 liter

**Procedure:**

- 1) Prepare a suspension as in 3.2.1 Procedure (1), except substitute hard water for distilled water.
- 2) After final tumbling, remove jar and pour powder suspension evenly over the area of sieve. Take care not to allow powder to settle in jar. By means of a 1 inch prop, raise one edge of sieve frame and allow residue to drain 5 minutes.
- 3) Continue as in 3.2.1 Procedure (3). If filtrate is not free from powder, add a few milliliters of 5 per cent alum (Potassium aluminum sulfate) solution in order to flocculate particles, and put through filter again.

**4.1 Application for Permitted Insecticide** - Both manufacturer and distributor are required to certify that their formulation will be kept uniform with specifications. Forms ADE 10-12 and 10-13 for this purpose are obtainable from Director, Animal Disease Eradication Division, Agricultural Research Service, United States Department of Agriculture, Federal Center Building, Hyattsville, Maryland 20781.

**4.1.1** In addition, the manufacturer must submit a representative sample (16 oz) and a printed label for examination.

**4.1.2** Deviation from specifications and any change in brand name will invalidate the permission granted under application.

**5.1 Labeling** - The labeling shall be registered in accordance with the Federal Insecticide, Fungicide and Rodenticide Act under the jurisdiction of the Pesticides Regulation Division, Agricultural Research Service, Washington 25, D. C. It is recommended that the manufacturer include a statement to the effect that State and Federal animal disease regulatory officials be consulted concerning the product's official use in animal disease regulatory programs. It would also be helpful if the label referred to "scabies and mange" without listing specific mites, or, if mites are listed, the listing should include Psoroptic, Chorioptic and Sarcoptic mites.

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TSC (Technical Services Chemistry)